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Completing the square we have

$$x^2 - x/3 + 1/4s^2 = 9 - 3/s + 1/4s^2.$$

Hence

$$x - 1/2s = 3 - 1/2s, \text{ or } x = 3.$$

The fallacy will at once appear if it is observed that the same arguments could be used with respect to the two equations

$$x^2 + y = 9 + a \dots (1),$$

$$y^2 + x = 3 + \beta \dots (2).$$

These may be written as follows:

$$x^2 - 9 = a - y = d \dots (3),$$

$$x - 3 = \beta - y^2 = sd \dots (4).$$

As x cannot be equal to 3 for an arbitrary pair of values of a, β it follows that the method is fallacious. Just as in the preceding solution it is implicitly assumed that any point on $x^2 - 9 = (x - 2)/s$ must be common to the given parabolas. And the probability that this method should lead to the correct result in a given problem is again zero.

278. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.

$xyz(\Sigma x)^2 < 3\Sigma y^2 z \Sigma yz^2$, if x, y, z are positive.

Solution by G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.

$$\frac{x^2 y + y^2 z + z^2 x}{3} > (x^2 y \cdot y^2 z \cdot z^2 x)^{1/3} > xyz. \quad \text{Also } \frac{xy^2 + yz^2 + zx^2}{3} > xyz.$$

$$\therefore 3 \Sigma y^2 z \Sigma yz^2 > 27x^2 y^2 z^2 > xyz \cdot 27xyz.$$

$(x + y + z)^2$ is the greatest when $x = y = z$, and is then equal to $9x^2$.

$$\therefore (x + y + z)^2 < 27xyz. \quad \therefore xyz[\Sigma(x)]^2 < 3 \Sigma y^2 z \Sigma yz^2.$$

279. Proposed by THEODORE L. DE LAND, Treasury Department, Washington, D. C.

The United States Panama Canal Bonds were issued, to date August 1, 1906, and will mature on August 1, 1936; and they bear interest at the rate of 2% per annum, payable quarterly, on the first day of November, 1906, and the first day of February, May, and August, 1907, and so on for each succeeding quarter, until the bonds mature, when the principal will be paid at par with the last quarter's interest. The coupon bonds of this loan were quoted on the New York Stock Exchange, at 10.30 a. m., on December 17, 1906, at 103 $\frac{3}{4}$ bid and 104 $\frac{3}{4}$ asked.

Required: The rate of interest per annum, payable quarterly, an investor would *realize* if he purchased the Panama bonds on December 17, 1906, and could reinvest his interest income, quarterly, at the *realized* rate.